

AMENDMENTS TO THE CLAIMS

The following is a complete, marked-up listing of revised claims with a status identifier in parenthesis, underlined text indicating insertions, and strike through and/or double-bracketed text indicating deletions.

LISTING OF CLAIMS

1. (Currently Amended) A device in a simulation system for simulating an interventional operation, said device being arranged to receive ~~a number of real instruments, preferably~~ at least two real instruments, ~~the device~~ comprising:
 - a number of moveable carriages corresponding to ~~[[the]]~~ a number of said real instruments,
 - a track, and
 - an interconnecting member,
 - wherein said interconnecting member is arranged to interconnect said carriages serially, each carriage having an opening for enabling reception of said real instruments, each carriage further ~~comprising members~~ comprises:
 - a member for receiving and locking at least one real instrument, and
 - a member for receiving a movement from said instrument and generating a force feedback to said real instrument with respect to a simulation characteristic, and
 - wherein said opening is provided within said interconnecting member.
2. (Canceled)

3. (Previously Presented) The device of claim 1, wherein said interconnecting member is a telescopic pipe.
4. (Previously Presented) The device of claim 1, wherein each carriage comprises a detecting arrangement for detecting ~~[[the]]~~ a type of said real instrument inserted through said interconnecting member.
5. (Currently Amended) The device of claim 1, wherein said device is connected to a control unit to measure the movement of said carriages and control said movement by ~~means of~~ a speed control loop and a position control loop.
6. (Previously Presented) The device of claim 1, wherein said carriages are arranged to move along said track.
7. (Previously Presented) The device of claim 1, wherein said carriage has an actual position and a simulated position, which actual carriage position determines the simulated carriage position from a scale table.
8. (Previously Presented) The device of claim 1, wherein said carriage is connected through a transmission for driving along said track.
9. (Previously Presented) The device of claim 1, wherein said carriage is provided with a crank block, which is arranged in a torque wheel.

10. (Currently Amended) The device of claim [[1]] 9, wherein said crank block comprises a mating surface, which is pressed towards a collet that grips the instrument wire.
11. (Currently Amended) The device of claim [[1]] 9, wherein the force between a suspended plate and a chassis, which is arranged on said carriage, is measured by ~~means of~~ a force sensor.
12. (Previously Presented) The device of claim 1, wherein said carriage comprises a detecting member, which detects presence of an instrument in the carriage.
13. (Previously Presented) The device of claim 1, wherein said detecting member is arranged to detect the type of each real instrument.
14. (Previously Presented) The device of claim 13, wherein said real instruments are arranged to be categorized with respect to at least one of the following characteristics; thickness, color, structure, material, identity and/or bar-code.
15. (Previously Presented) The device of claim 12, wherein said detecting member is an optical sensor.
16. (Previously Presented) The device of claim 1, wherein a first interconnecting member is arranged between said opening and the first carriage, a second interconnecting member is arranged between the first carriage and the second carriage and a third interconnecting member is arranged between the second

carriage and the third carriage.

17. (Previously Presented) The device of claim 1, comprising a processing unit for measuring a longitudinal movement and a movement of rotation, of the instrument.
18. (Previously Presented) The device of claim 1, comprising a processing unit, which provides force-feedback in a longitudinal direction and in a direction of rotation of the real instrument.
19. (Previously Presented) The device of claim 1, wherein an end of said real instrument is simulated.
20. (Previously Presented) The device of claim 1, comprising a locking member, for clamping an instrument, which locking member is attached to a central wall.
21. (Currently Amended) The device of claim [[1]] 20, wherein said locking member comprises a member for applying a torque.
22. (Currently Amended) The device of claim [[1]] 9, wherein said crank block is provided inside a torque wheel, which crank block moves in longitudinal direction and is fixed in the direction of rotation, relatively to the torque wheel.
23. (Currently Amended) A method of simulating a interventional operation by means of a device in a simulation system, said device being arranged to receive a ~~number~~

~~of real instruments, preferably at least two real instruments, the device~~
comprising:

a number of moveable carriages corresponding to ~~[[the]]~~ a number of said instruments,

a track, and

an interconnecting member,

the method comprising the steps of:

inserting a number of real instruments into said device, and

receiving said real instruments by each carriage, which are interconnected serially, each carriage having an opening for enabling reception of said real instruments, by receiving ~~and~~ and locking at least one instrument, each carriage further ~~comprising~~ includes members a member for receiving a movement from said real instrument and a member for generating a force feedback to said real instrument with respect to a simulation characteristic, and said opening is provided within said interconnecting member.

24. (Currently Amended) ~~[[A]]~~ The device according to claim ~~[[1]]~~ 35 ~~in a simulator system, preferably an interventional procedure simulator system~~, comprising at least a first and a second displaceable member, and a control system comprising:

a first controller, controlling the speed of said first displaceable member towards a set value, and

a second controller, for combining an error in a position and a speed of said second, previous displaceable member to a set speed for the first member, wherein the second controller controls $CDV = C1 * (CAP - PCAP) + C2 * PCAV$, wherein C1 and C2 are constants.

25. (Currently Amended) [[A]] The device according to claim [[1]] 35 ~~in a simulator system, preferably an interventional procedure simulator system~~, comprising an arrangement for detecting a real instrument to be simulated, wherein said arrangement ~~comprises~~ includes an identification ~~means~~ device for identifying said real instrument.

26. (Previously Presented) The interventional procedure of claim 25, wherein said arrangement for detecting an instrument, comprises at least one IR diode and at least one IR phototransistor.

27. (Currently Amended) The interventional procedure of claim 25, wherein said identification ~~means~~ device ~~consists of~~ includes at least one of thickness, color, structure, material of said real instrument, identity and/or bar-code.

28. (Currently Amended) [[A]] The device according to claim [[1]] 35 ~~in a simulator system, preferably an interventional procedure simulator system~~, further comprising members to receive and lock a real instrument to be simulated, and a control unit ~~comprising~~ includes a force sensor, wherein said control unit controls towards a demand force value, and a force that a user experiences in the instrument is measured with the force sensor, and a signal from the force sensor is fed back in a force feedback control loop towards a set force.

29. (Currently Amended) [[A]] The device according to claim [[1]] 35 ~~in a simulator system, preferably an interventional procedure simulator system~~, comprising an arrangement for generating a resistance in a simulated real instrument, the

arrangement comprising a control unit, a force sensor, a force feedback control loop for controlling a actuator device for driving an instrument receiver member in a direction, and an inner ~~faree~~ force control loop wherein said force sensor is arranged for measuring said resistance, a signal from the force sensor is fed back in said inner force control loop that controls, with a loop amplification provided by said control unit, towards a set force value provided by said control unit and said inner force control loop controlling said actuator, said system further comprises:

a device arranged to receive at least two real instruments,

a number of moveable carriages corresponding to a number of said real instruments,

a track, and

an interconnecting member,

wherein said interconnecting member is arranged to interconnect said carriages serially, each carriage having an opening for enabling reception of said real instruments, each carriage further comprises:

a member for receiving and locking at least one real instrument,

and

a member for receiving a movement from said instrument and generating a force feedback to said real instrument with respect to a simulation characteristic, and

wherein said opening is provided within said interconnecting member.

30. (Previously Presented) The simulator system of claim 29, wherein said control unit controls said loop amplification to achieve a said resistance.

31. (Previously Presented) The simulator system of claim 29, wherein said control unit controls said set force to achieve a said resistance.

32. (Currently Amended) ~~[[A]]~~ The device according to claim ~~[[1]]~~ 35 ~~in a simulator system, preferably an interventional procedure simulator system,~~ comprising an arrangement for generating a resistance in an simulated real instrument, an arrangement for receiving and fixing a part of a real instrument in a device for measuring instrument movement and feeding back a force to said real instrument, said arrangement ~~comprising~~ includes a member for clamping said real instrument.

33. (Previously Presented) The arrangement of claim 32, comprising a crank block, which is arranged in a torque wheel, said crank block being movable in a longitudinal direction inside said torque wheel.

34. (Previously Presented) The arrangement of claim 33, wherein said crank block is provided with a mating surface, which is pressed towards a collet that grips said instrument part.

35. (New) The device of claim 1, wherein the device is an interventional procedure simulator system.